Biocleantechsystem@gmail.com (503)860-5302 **Bashar Al-Daomi**

Experience Summary

Bashar has a mix experiences of wastewater engineering researcher, good background in teaching and mentoring young engineers and supporting client projects with feasibility studies, bench-and pilot-scale testing, alternative analyses, and modeling efforts. His most recent experience has focused on aeration basin improvements, including BioWin, Pro2D^2 and AFT model development, calibration, verification, and results documentation. Bashar has worked on updating O&M Manual for wastewater ponds, developing channel mixing alternatives study and condition assessment to save energy for the client. As part of this work and other projects he has produced several technical memorandums, facility testing plan, wastewater mass balance, and cost estimates to characterize each project. Moreover, in his PhD research, Bashar has designed, built, and operated Pilot/lab scale process engineering skills: Designing, Fabricating, and Operating lab bioreactors that have been leading successful research with earning total cash prize $62,000 from several competitions, scholarships, and awards. His research investigated the feasibility of combining SNdN and EBPR systems under low DO concentration using cyclic aeration mode to remove nitrogen and phosphorus simultaneously.

Education

- *Ph.D. Candidate, Environmental Engineering, Portland State University, 2019*
- *M.Eng, Environmental Engineering, Portland State University, 2017.*
- *Graduate Professional Diploma Program GPDP, Sanitary Engineering Track, UNESCO-IHE Institute for Water Education, The Netherlands, 2017.*
- *MSc, Environmental Engineering University of Baghdad, Iraq, 2009.*
- *B.Sc., Environmental Engineering, Al-Mustansiriya University, Iraq, 2006*

Experience

- *Wastewater Process Engineer at Jacobs Engineering Group, (Nov. 2021– Nov. 2022)*
- *Senior Staff and Process Engineer at Brown and Caldwell BC (June 2020 – October 2021)*
- *6 months (Intern/mentorship) at Clean Water Services with Dr. Bruce Roll*
- *4.5 years (Graduate Teaching Assistant at Portland State University: Unit operations, Hydraulic & Fluid mechanics, Fate & transport in Toxics in Environment, Environmental Engineering courses)*
- *4.0 years (Assistant lecturer at University of Baghdad: Sanitary engineering, Hydraulic & Fluid mechanics courses)*

Relevant Expertise

- *BioWin, Applied Fluid Tech AFT and Pro2D^2 modeling*
- *Visio software, ProjectWise, Outlook, Bluebeam*
- *Pilot/lab scale studies: Process engineering, Designing, Building, and Operating EBPR and SND systems to remove nutrients from wastewater*
- *2023 WLI Steering committee member & mentor (Water Leadership Institute/WEF),*
- *Active committee member and reviewer of 2021 PNCWA conference,*
- *Water Leadership Institute WLI at WEF2020,*
- *Student Sustainability Center Leader at PSU*

Crescent City WWTP Optimization. Jacobs/Process Engineer/2022 Bashar was involved in developing historical data analysis for the existing treatment plant, two treatment lines: Rotating Biological Contactors (RBC) and Membrane Bioreactor (MBR). He was involved in setting-up and running a Pro2D2 modeling to demonstrate the plant capacity and treatment performance and operations reliability. As part of the deliverables, wastewater and nutrients sampling plans were developed, working with three vendors to study refurbishing the RBCs, site visit was done, and plant capacity technical memorandum was written.

Pilot Test Plan for the evaluation of PFA Disinfectant at the Gresham WWTP. Jacobs /Process Engineer/2022 Bashar was involved in running and sampling (daily grab and weekly composite samples) the Kemira pilot plant and testing PFA. The running and testing were done according to Kemira standards and protocol.

Pilot Test Plan for the evaluation of possibility achieving Simultaneous Nitrification and Denitrification (SNdN) at Marine Park WWTF. Jacobs /Process Engineer/2022 Bashar relocated his pilot system and placed at Marine Park WWTF in July 2021 to be used to investigate the possibility of achieving SNdN and reducing the energy. It is a collaborated work between Jacobs, Bashar's pilot system, and the city of Vancouver.

Ridgefield Treatment Plant Wastewater Treatment Process Improvements. Jacobs/Process Engineer/2022/ Bashar was involved in developing historical data analysis for the existing complete mixing aeration basins, analysis of applying plug flow operating configuration scenario and writing engineering report demonstrating the plant capacity and treatment performance and operations reliability.

Marine Park WWTF Denitrification Assessment. Jacobs/Process Engineer/2022/ Bashar was involved in setting up a pilot plant system at Marine Park WWTF to addressing inhibition of denitrification in the anoxic selectors of the aeration basins at Marine Park. As part of the deliverables, reviewing the existing facility design and operation and bench-scale lab analysis were done.

Marine Park WWTF UV Disinfection System Replacement. Jacobs/Process Engineer/2022/ Bashar was involved in replacing the existing UV disinfection system (LPLO UV) with HPLO UV and designing the new deep influent open channel perpendicular to the UV channel. As part of the deliverables, reviewing the existing facility design and new UV design will be done.

WWTP Anaerobic Digestion and Cogeneration Expansion – Potential Capital Funding Sources. Jacobs/Process Engineer/2022/ Bashar was involved in searching and writing a technical memo (TM) to identify potential funding options for the City of Gresham to consider as they develop this project to a predesign level. This memorandum summarizes potential financing sources available to the city from state and federal agencies as well as private financing. The memo briefly describes each program, including interest rates, fees, and other requirements where available, and provides eligibility criteria when applicable.

Arlington Water Pollution Control Plant / Design Hydrolysis Thermal Process. Jacobs/Process Engineer/2022/ Bashar was involved in developing and running a Pro2D^2 modeling to demonstrate the impact of adding THP process on the plant nitrogen limits (Proposal efforts).

Baton Rouge South Treatment Plant Secondary Treatment Process Improvements. Jacobs/Process Engineer/2022/ Bashar was involved in developing historical data analysis for the existing treatment plant and set-up and run a Pro2D2 modeling to demonstrate the plant capacity and treatment performance and operations reliability (Proposal efforts).

Port of Moses Lake Wastewater Facilities (WWF) Expansion Operation and Maintenance Manual. Jacobs/Process Engineer/2022/ Bashar was involved in updating O&M Manual after adding the 3rd pond to the Port of Moses Lake WWF.

Columbia Boulevard WWTP Secondary Treatment Expansion Project (STEP). Jacobs/Process Engineer/2021 & 2022/ Bashar was involved in developing alternative scenarios for supplementing oxygen that required to bring DO to 4 mg/L in aeration basins, working with two main vendors to study High-Purity oxygen alternative by analyzing the quality of LOX tanks, ISO mixers, and Triton Mixers to meet the required oxygen. Besides working on QC for some of this project tasks, he has helped on developing facility (pilot) testing plan for two phases, collecting data, and writing TM. He also helped on updating the PFD for operation strategy TM by using Visio software.

Caldicellulosiruptor bescii (C. bescii)—thermophilic bacteria Bench-scale at Gresham WWTP. Jacobs /Process Engineer/2021 & 2022/ Bashar was involved in running and sampling the C. bescii-Jacobs treatability system/ Bioprocess Bench scale/ continuous-feed anaerobic system at the Gresham Wastewater Treatment Plant (WWTP).

MWMC Aeration Basin Improvements. BC/Process Engineer/2020 & 2021/ Bashar was involved in developing historical data analysis, BioWin dry weather calibration, wet weather calibration, alternative modeling scenarios, channel mixing alternatives study, Blower alternatives study, Condition assessment, Business Case Evaluation, and AFT simulator application. Historical data analysis and Model results were used to identify and validate observed capacity issues. Based on this information and City staff input, capital improvement projects and alternatives have been developed to alleviate modeled capacity issues. As part of the deliverables, sampling plans were developed, plant capacity technical memorandums were written.

Oak Lodge Water Services District, Sanitary Sewer Master Plan. BC/Process Engineer/2021/ Bashar was involved in developing the master plan for Oak Lodge treatment plant, conducting historical data analysis, implementing sampling plan study in field.

Vancouver Westside WWTP Analysis, Vancouver, City of Washington. BC/Project Engineer/2021/ Bashar was involved in the initial phase of this project to analysis, identify, evaluate the impacts of septage on the Westside WWTP and present possible mitigation measures for these impacts. The scope included: Quantifying the loading of septage to the facility, Characterizing the septage entering the facility, identifying possible process impacts of septage to the facility (e.g., aeration demand) and identifying potential septage

treatment methods that could be employed at the facility. As part of the evaluation, a mass balance was developed for the plant.

CWS Clean Water Services, Durham plant, Fate Oil grease FOG Tank Design. BC/Contributor Engineer/2021/ Bashar was involved in reviewing the submittals for the new piping and tanks.

City of Vancouver, Washington State, Industrial Pretreatment Lagoon Upgrades. BC/Contributor Engineer/2021/ Bashar was involved in reviewing the submittals for the new air blower.
AWS Water Design and Permitting. BC/Contributor Engineer/2021/ Bashar was involved in industrial engineering services during construction by observing the field work during mapping the pipeline, and boring process/Geotech work.

Gresham Digester cover evaluation, City of Gresham. BC/Contributor Engineer/2021/ Bashar was involved in developing business case scenario and alternatives study to evaluate the existing digester.

Kailua WWTP Ph 2 Upgrading Design, Honolulu City. BC/Contributor Engineer/2021/ Bashar was involved in documenting the request for information RFI coming from BC experts, contractors and sub-contractors.

Pilot/lab scale research study, Portland State University. PhD researcher/2017-2020/ Bashar took the responsibility to raise fund, design, build and operate lab scale systems (Anaerobic, Anoxic, Aerobic reactors, and Biological Aerated Filter) conducting research to investigate the feasibility of combining SNdN and EBPR systems under low DO concentration using cyclic aeration mode to remove nitrogen and phosphorus simultaneously. The total cash prize earnings reached to $62,000 from several competitions' awards, scholarships, leadership, and sustainability awards.

PhD. Dissertation and Research Topics/Interests:

- Optimizing Simultaneous Nitrification and Denitrification (SNdN) for the growth of denitrifying phosphate-accumulating organisms (DPAOs)
- Optimizing Enhanced Biological Phosphorus Removal (EBPR) for the growth of denitrifying phosphate-accumulating organisms (DPAOs)
- Investigating the possibility of combined EBPR and SNdN for better Phosphorus and Nitrogen removal

Memberships

- Water Environment Federation,
- The Pacific Northwest Clean Water Association (PNCWA),
- American Water Work Association AWWA,
- American Society of Civil Engineers ASCE.

Presentations (Water education, Diversity and Leadership)

- Going with flow: A lifelong journey of water education, Public Education Webinar, Water Leadership Institute, Water Environment Federation 2020.
- Fostering diversity, leadership and growth in water industry INtroducing Future Leaders to Opportunities in Water (InFLOW), The Pacific Northwest Clean Water Association (PNCWA), 2019.
- Wastewater Purification" Humanists of Greater Portland, Portland, Oregon, 2019.

Awards

- Wow award, Brown and Caldwell, 2021
- MoHESR scholarship,
- $2000 Anchor QEA scholarship,
- $14000 PNWS-AWWA scholarships (Two Albert Alsing and E & T, Association Northwest Washington Subsection and E & T),
- Grand prize $8000 PSU Cleantech Challenge,
- $3500 leadership and sustainability awards, and
- $1000 Beta Project, Portland State University, and $32,000 others.
- The 2019 Inspiring Student / Excellence in Sustainability Award,
- Outstanding International Student award,

Leadership activities outside research and professional work

- Steering Committee member, Class of 2023 Water Leadership Institute WLI / Water Environment Federation WEF.
- Graduate of Class of 2020 Water Leadership Institute WLI / Water Environment Federation WEF.
- 2021 PNCWA conference, Committee member.
- 2021 PNCWA Social Justice Subcommittee member.
- Online Course on Dynamic Simulation for Design and Optimization of Water Resource Recovery Facilities (Wastewater Treatment Plants), Daniel Nolasco, UCI, 2022.
- Awarded certificates in BioWin Simulation Training / 4 days training on "Setting up whole plant models" and "Advanced BioWin" on wastewater treatment by EnviroSim Associates Ltd.
- 2020 PNCWA Abstract reviewer (20 abstracts).
- 2022 PNCWA Abstract reviewer (18 abstracts).
- Quantitative Microbial Risk Assessment workshop. Interdisciplinary Instructional Institute. University of Washington, 2017.
- Activated Sludge: Microbiology of Industrial Wastewater workshop. Novozymes Biologicals Inc. Salem, VA, 2017.
- Volunteer Steward at Fernhill Wetlands. Clean Water Services, 2017.
- International Graduate student mentor & mentor Leader for 62 mentees from 20 countries.
- Student Leadership Council member and Advisory Board member, Student Sustainability Center, Educational Leadership Service Award steering committee member, PSU.
- Alternative Spring Break volunteer with Student Community Engagement Center, PSU. Serving Project Open Hand and GLIDE of San Francisco on the issue of food insecurity, 2017.

Courses

- Biological Wastewater Treatment Principles, Modelling and Design,
- Dynamic Simulation for Design and Optimization of Water Resource Recovery Facilities (Wastewater Treatment Plants)
- Constructed Wetlands for Wastewater Treatment CWWT,
- Experimental Methods in Wastewater Treatment,
- Industrial Resource Management and Cleaner Production,
- Industrial Effluent Treatment IET,
- Modelling Sanitation Systems, Water Transport and Distribution
- Fate & Transport in Toxics in Environment,
- Microbiology Environmental Engineering,
- Water Quality Modelling,
- Unit Operations-Environmental Engineering

Media
https://basharaldaomi.com/